At the present time two of the most important questions in the public mind are how the enormous demand for motor spirit that has of late developed is to be met, and the imperial question of securing fuel oil for our Navy in the case of war interfering with our over-sea supply, and it will be of interest to see how far the Scotch shale-oil industry can help in these directions.

The rapid increase in the number of motor-driven vehicles during the past few years has doubled the consumption of motor spirit since 1908, the amount used in this country during 1912 reaching the enormous total of 80,000,000 gallons, whilst the quantity of motor spirit produced by the Scotch distilleries would be about 600,000 gallons, or 0·75 per cent. of the total used, an amount which is practically negligible. Considerations of safety on board limit the proportion of the oil that can be used for naval fuel, and the total amount of oil of satisfactory character that is at present produced by the Scotch industry and would be available for such purposes would be only about 50,000 tons, which again is only a small fraction of the quantity needed, but the proximity of the shale fields to the new naval base at Rosyth encourages the hope that the Government will secure and accumulate a sufficient quantity of liquid fuel from this source to safeguard the supply in case of war.

In the portion of the memoir dealing with the chemistry of the oil-shales, Mr. Steuart has collected a mass of most interesting facts, not only with regard to the shale oil, but also bearing upon the probable formation of the shale beds, and the whole work is so full of interesting and suggestive points that no one interested in oil or allied subjects should fail to read it.

THE ANALYSIS OF COLOURING MATTERS.

THE Eighth International Congress of Applied Chemistry, which was held in New York in September last, adopted a report submitted by a subcommittee of the Commission Internationale d'Analyses, to which was referred the question of the possibility of unifying the methods of analysis of organic colouring matters.

The subcommittee was international and very representative in character, the British members being Prof. E. Knecht and Mr. C. Rawson of Manchester. The report, which was presented by the president, Dr. F. Reverdin (Switzerland), in a short historical summary of the subject, states that the first systematic scheme was that of O. N. Witt, who, in 1886, suggested a differentiation of the various types of colouring matters by their behaviour on reduction. This reaction, developed and improved by other workers, notably by A. G. Green, is now the basis of the usual method of identification. So early as 1874 Kopp proposed the use of the characteristic absorption spectra of dyes as a means of identifying them, and this method has been greatly improved and extended by Formanek, Grandmougin and others. The photo-spectroscopic method proposed in 1911 by Porai-Koschitz and Auschkap has not yet been much used.

The individual reports from the various national representatives, which constitute the bulk of the report, deal mainly with the analysis of colouring matters for Customs purposes.

The subcommittee finally reports that the unification of the methods employed in the analysis of colouring matters is not possible in the present state of the industry, and would not be of much practical use. It considers, however, that an international agreement would be advantageous in certain cases, such as that of the organic dyestuffs used in colouring foodstuffs, and also where the assessment of Customs duties is required.

The subcommittee has therefore been reappointed by the International Commission of Analysis and instructed "to investigate special cases in which the unification of the methods of analysis of organic dyestuffs offers some interest from the international standpoint."

The committee requests that anyone interested in the subject will communicate information or suggestions to the president (Dr. F. Reverdin, Geneva) or to the British representatives above named.

NOTES.

THE death of Lord Wolseley on March 25, in his eightieth year, should not pass unrecorded in a scientific journal, for he was distinguished among great soldiers by his devotion to scientific methods. His capacity for organisation, recognition of the value of knowledge, and regard for accuracy and completeness are attributes not always associated with military careers. His "Soldier's Pocket-Book," now published by the War Office, is rich in details relating to medical, engineering, and other aspects of field operations which depend upon science for their success. He held that it was essential for every officer to have a good knowledge of his science in order to be able to apply that knowledge usefully in the field, when cut adrift, perhaps, from civilisation. We share with the rest of the nation the feeling of regret that a life which has brought so much credit to the British Army is now ended. Lord Wolseley's body was laid to rest in St. Paul's Cathedral on Monday, with impressive funeral ceremonies, but his works will long remain a monument to his memory.

THE construction of trustworthy and enduring flying machines has been much encouraged by various large money prizes given by *The Daily Mail.* When in 1906 our enterprising contemporary offered a prize of 10,000*l.* for a flight by aëroplane from London to Manchester in twenty-four hours, with not more than two stoppages, there was little anticipation that it would be won, yet M. Paulhan accomplished the feat in 1910. A further prize of 10,000*l.* for a circuit of Great Britain, covering a distance of 1000 miles in one week, with eleven landing-places, or control stations, at each of which a descent had to be made, was won by M. Beaumont in 1911. Now *The Daily Mail* offers a third prize of 10,000*l.* for a flight by waterplane either way across the Atlantic in seventy-two continuous hours, without any limitation as to nationality of pilot or place of construction of the machine. A prize of 5000*l.* will also be awarded to the pilot who takes a waterplane of entirely British invention and construction round England, Scotland, and Wales, and within one mile of Kingston Harbour, in seventy-two continuous hours. The waterplane is a very promising type of aircraft, and we have little doubt that both prizes will eventually be won. From a national point of view it is important that encouragement should be given to the design and performance of a machine which can start from a water surface or come to rest upon it. The prescribed tests are severe, but not more so than are necessary to decide the efficiency of the waterplane both as regards flexibility and range of action. The new prizes offered by *The Daily Mail* will encourage aviation engineers and pilots to produce a machine by which the two courses will be successfully traversed, and thus bring us nearer that conquest of the air which will be the distinguishing characteristic of the present century.

In America it is quite common for waters to have an unpleasant fishy, oily, or "geranium" taste, due to the excessive growth of certain algæ. Some species grow best during the colder months of the year, others attain their maximum development during the summer. The water supplies of the United Kingdom are usually free from these unwelcome visitations, but many instances have occurred of temporary unpleasantness arising from this cause. London has been singularly fortunate in this respect, yet there can be no doubt that the present commendable policy of storing river water antecedent to filtration increases the risk of algal troubles arising in the future. At Easter time the consumers of West Middlesex water became unpleasantly aware that the supply had a peculiar aromatic taste and smell, which, with apologies to horticulturists, may be likened to geraniums. The water is derived from the Thames, and is stored for a long period in the Staines reservoirs. After re-storage at Barn Elms and Barnes, it is filtered and pumped into supply from the Hammersmith side of the river. First the complaints arose along the line of direct supply from the pressure mains, later the Hampstead area became affected owing to the back-flow of tainted water which meanwhile had accumulated in the service reservoirs. Dr. A. C. Houston informs us that the growth was largely composed of Tabellaria, together with some Asterionella, and the taste developed chiefly during the process of filtration. Remedial measures were at once carried out, and all the implicated filter beds were closed, with immediately satisfactory results. The water, although unpalatable, was at no time unsafe for drinking purposes. The best way of killing algæ is to treat the affected water with copper sulphate (dose, from 1 to 10 lb. per million gallons), and Dr. Houston has found that the most satisfactory way of removing the taste from a water which has become already tainted is to use potassium permanganate (dose, about 2·5 to 5 lb. per million gallons).

The International Geographical Congress was opened at Rome on March 27 by King Victor Emmanuel. We hope to give an account of the proceedings in an early issue.

We are informed that the Royal Botanic Gardens Department, Ceylon, has been replaced by a Department of Agriculture, and that communications should in future be addressed to the Director of Agriculture, Peradeniya, Ceylon. The work of the Royal Botanic Gardens will be continued under the new department.

On the nomination of the Gassiot Committee of the Royal Society, the Meteorological Committee has appointed Mr. L. F. Richardson, assistant lecturer in physics at the Municipal School of Technology, Manchester, to be superintendent of the Geophysical Observatory at Eskdalemuir, in succession to Mr. G. W. Walker, resigned.

The Vienna correspondent of *The Times* announces that Prof. J. Hampel, the eminent Hungarian archæologist, died at Budapest on March 25. As one of the directors of the National Museum and the leading authority on the pre-Christian archæology of Hungary, Prof. Hampel was held in high esteem in his own country and in archæological circles throughout Europe.

We are informed that the optical and mechanical engineering works of Ernst Leitz, of Wetzlar, which recently completed their 150,000th compound microscope, have presented this instrument to his Excellency Prof. Ehrlich, of Frankfort-on-Main, thus doing honour to a genius of scientific discovery. It may be remembered that the 100,000th Leitz microscope was presented to the late Prof. Robert Koch, the famous bacteriologist, who was director of the Imperial Institute for Infectious Diseases, Berlin.

Arrangements are being made for the starting, in July next, of an expedition to Crocker Land, under the auspices of the American Museum of Natural History and the American Geographical Society. One of its special features will be a seismological investigation. The seismograph, which will be in charge of Ensign Fitzhugh Green, of the U.S. Navy, is of the Weichert horizontal type, and carries a stationary mass of 80 kilos. It will be sheltered in a hut of special design, so arranged as to preclude violent changes of temperature. The instrument will be furnished by Georgetown University, Washington, and an attempt will be made to carry on daily communication, by means of wireless messages, between the explorers and the seismographers of the University.

The inauguration of a new President at Washington has necessarily been followed by many changes in important Federal offices. Among them is the appointment of Dr. D. F. Houston to be Minister of Agriculture, succeeding Mr. J. Wilson, who has held that post continuously for sixteen years, under four administrations. Dr. Houston was president of the Agricultural and Mechanical College of Texas from 1902 to 1905, and of the University of Texas from 1905 to 1908. Since that date he has been

Chancellor of the Washington University at St. Louis. He is now in his forty-eighth year. A change has also been made in the assistant secretaryship of the Department of Agriculture, where Mr. W. M. Hays is succeeded by Mr. B. T. Galloway, who has been since 1900 chief of the Bureau of Plant Industry. Mr. Galloway had previously spent twelve years as chief of the Division of Vegetable Pathology and Physiology. Before entering the Government service he was an assistant in the horticultural department of the University of Missouri, of which he was a graduate in agricultural science. He is the author of a large number of works on botany and horticulture.

An official guide, who commenced his duties on April 1, has been appointed to conduct parties of visitors round the collections in the Royal Botanic Gardens, Kew. Two tours will be made daily, except on Sundays and public holidays; one of about an hour and a half, starting at 11.30 each morning, and one of about an hour at 3 each afternoon, except during June, July, and August, when the afternoon walk will start at 5. Morning parties will be limited to six persons, and will visit the plant houses and museums; in the afternoon twenty persons will be conducted round parts of the outdoor collections. In the morning each member of the party will be charged 2*s*. 6*d*., and in the afternoon the charge per person will be 1s. Visitors wishing to join a party should attend at the stone portico of Cambridge Cottage, Kew Green, shortly before the time of starting. The new arrangement will meet the needs of those visitors who, in addition to their desire to enjoy the beauty of the gardens, wish to understand something of the scientific value and botanical significance of the unique exhibits at Kew.

Disastrous floods have followed the severe windstorms in the United States on March 23. The areas chiefly affected are the middle western States. The storms seem to have started on the eastern side of the Rockies, and to have rapidly developed energy occasioning the heaviest rains in the Ohio and Mississipi valleys. Immense tracts of country have been submerged, and many large towns have become flooded. Much of the ground is below the flood level of the rivers, and in parts the embankments have given way, whilst many tributary rivers have overflowed their banks. Dayton, Indianapolis, Columbus, and numerous other smaller towns have suffered immensely during the last week of March and much loss of life has occurred. Hundreds of houses have been washed away, and immense suffering has been caused. At Louisville the river is said to have passed the level of the great flood of 1907. Fortunately the immense loss of life given in the earlier reports was somewhat exaggerated, and later estimates at the end of March give the total casualties in the stricken area as 500. The rivers are said to be still rising in many places, and the full result of the disaster will depend largely upon the weather for the next week or two.

We have received the first two monthly issues of *The O.S. Review, the Journal of the Organisation Society*. This society (which has offices at 15–16 Buckingham Street, Adelphi) aims at applying objective methods of analysis and presentation to the data upon which all social legislation and administrative activity upon the large scale must be based. This aim necessarily implies that the society must itself "be outside politics, parties, and every kind of movement" in order to become "a centre of authority and reference," the activities of which will tend to bridge the present "gap between legislation and fact," and to minimise the distorting effects of political bias. The two numbers of the review offer illustrations of the proposed methods of research and of the application of the society's cardinal principle that "society is an extension of the individual." The society has a branch—"the Andrological Institute"—the special function of which is to collect and analyse measurements of bodily organs and physical and mental functions. As an *exposé* of its aims and methods it has published an elaborately illustrated pamphlet which deals in particular with measurements of mental "perseveration."

The general meeting of the American Philosophical Society will be held in Philadelphia on April 17–19, when the president, Dr. W. W. Keen, will take the chair. A very varied programme will be provided, and it is possible here to refer to a few only of the numerous papers. These include:—"Interpretations of Brain Weight," Prof. H. H. Donaldson; "Heredity and Selection," Prof. W. E. Castle, of Harvard University; "The Nature of Sex and the Method of its Determination," Prof. C. E. McClung, of Pennsylvania University; "The Control of Typhoid Fever by Vaccination," Prof. M. P. Ravenel, University of Wisconsin; "New Spectroscopic Evidence for the Solvate Theory of Solution," Prof. H. C. Jones, Johns Hopkins University; "The Magnetic Field of the Sun," Dr. G. E. Hale, director of the Solar Observatory at Mount Wilson, Cal.; and "Progress of New Lunar Tables," Prof. E. W. Brown, Yale University. On the evening of April 18, Prof. G. G. MacCurdy, Yale University, will give an illustrated lecture on "The Antiquity of Man in the Light of Recent Discoveries." On April 19 a symposium on wireless telegraphy has been arranged, in which the following physicists will take part:—Dr. L. W. Austin, head of the U.S. Naval Radio-Telegraph Laboratory; Prof. G. W. Pierce, Harvard University; Prof. M. I. Pupin, Columbia University, N.Y.; and Prof. A. G. Webster, Clark University, Worcester.

The problem of the cooperation of museums with education is being seriously considered in America. In No. 3, vol. iii. of *The Museum Journal* we have a description of the means by which the museum is being made accessible and interesting to school children. The arrangement of the exhibits is geographical, and special attention is naturally paid to the large collections illustrating the life of the American Indian, his arts and industries. A native and his wife, of the Chilkat tribe, are employed on the museum staff, and, dressed in their national costume, take an active part in class-work, moving among the children, explaining the exhibits, and answering questions regarding them. This arrangement is described to be successful in promoting among the children an intelligent interest in the collections.

American ethnologists generally accept the view that the American native race did not originate in that continent, but that it is the result of a comparatively recent, post-glacial, immigration, and that the Indian, closely related to the yellow-brown peoples of eastern Asia and Polynesia, represents, in the main, a gradual overflow from north-eastern Siberia. To supply evidence in support of these conclusions, Dr. A. Hrdlicka, of the U.S. National Museum, has recently made an extensive tour in Siberia and Mongolia, the results of which are summarised in No. 16, vol. lx., of the Smithsonian Miscellaneous Collections. His inquiries tend to establish the origin of the American Indian from eastern Asia. Dr. Hrdlicka points out the immense archæological remains, in the shape of burial mounds, or Kourgans, which still await excavation in north-eastern Asia. When the scientific exploration of this region is systematically undertaken, much important material for the examination of American ethnological problems will certainly be provided.

In *Man* for March Mr. J. Edge-Partington, under the title of "A Note on Certain Obsolete Utensils in England," gives an account of a collection of old-world appliances, mostly connected with cooking and brewing, which have passed out of use. Mr. Digby-Wyatt, in his house, Weston-Corbett, Hants, has furnished an old room with a very interesting series of such utensils. Mr. Edge-Partington's collection includes all sorts of curious specimens—fire-dogs, pestles and mortars, bread shovels, gophering-irons, meat-jacks, pot-hooks, and "lazy backs," brewing appliances, and many other things of the same kind, which throw much light upon the domestic life and manners of our ancestors. It is surely time that the suggestion for the establishment of a museum of folk culture, to contain specimens of this kind, which are rapidly disappearing and soon can never again be brought together, was seriously considered.

The campaign against tuberculosis has advanced a further stage. A general order of the Local Government Board, extending the principle of compulsory notification to all forms of human tuberculosis came into force on February 1. A further order of the Board of Agriculture and Fisheries makes the notification compulsory of tuberculosis of the udder, indurated udder, and other chronic diseases of the udder, and of tuberculosis or apparent tuberculosis of any bovine animal. This order is to come in force on May 1. Animals found to be suffering from tuberculosis are to be slaughtered, and compensation will be given on a scale depending on the extent of the tuberculous disease.

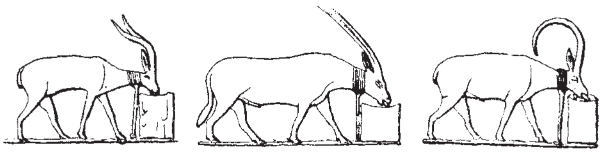
An appreciative memoir, accompanied by an excellent portrait, of Dr. E. A. Wilson, the naturalist to Capt. Scott's expedition, appears in the March number of *British Birds*, Dr. W. S. Bruce being the author; while the story of Wilson's life and work is sympathetically told by Dr. Shipley in the April number of *The Cornhill Magazine.*

A valuable report, by Mr. J. Johnstone, on some mussel beds in Lancashire and North Wales as regards their liability to sewage contamination has been issued by the Lancashire and Western Sea Fisheries District, under the direction of Prof. Herdman, F.R.S. The beds in several districts are found to be polluted. Mr. Johnstone, in his introduction, makes some interesting remarks on methods of examination and on "standards" from the statistical point of view.

We have to acknowledge the receipt of the fourth annual report—for the year ending March 31, 1912—of the Superintendent of Dominion Parks, Canada. It is there stated that the predictions made a few years ago "in regard to the mountain parks have been more than realised, and their development has already exceeded the most sanguine expectations. . . . Judging from past development and present indications, it is a difficult matter to estimate the limit of the usefulness of these mountain parks as unique pleasure and health resorts, not only for the Dominion, but for visitors and tourists from almost every part of the world." The report is profusely illustrated with photographs of striking scenery.

Additional evidence of the affinity of the Tertiary fauna of eastern Europe and western Asia to that of North America is afforded by Mr. E. Kiernick's description of a new species of Titanotherium from the neighbourhood of Prague, in *Bull. Ac. Cracovie* for December, 1912. The Titanotheres are essentially an American group of perissodactyle ungulates, but in 1876 a specimen from Transsylvania was referred to the family under the new generic term Brachydiastematherium, while in 1892 Prof. Toula referred a jaw from Rumelia to the American genus Menodus, as *M. rumelicus.* Some doubt has been thrown on the reference of the former to the Titanotheriidæ, but Mr. Kiernick considers that it is a member of that family, albeit of the aberrant group Palæosyopinæ. The Prague fossil, which consists of part of a lower jaw, with the last molar, is assigned to the typical genus, under the name of *Titanotherium bohemicum.*

From an interesting article by Dr. Claude Gaillard, of the Museum of Lyons, published in the *Revue d'Ethnographie et Sociologie,* Paris, 1912, Nos. 11 and 12, it appears that the ancient Egyptians were in the habit of keeping several of the wild ruminants of north-eastern Africa in a state of semi-domestication for the purposes of the table. Among the species thus kept were the dorcas gazelle, the addax, the white oryx, and the Nubian ibex, representations of all of which are shown in a bas-relief in the tomb of Mera at Sakkara, dating from the sixth dynasty, in asso-



Dorcas gazelle (A), white oryx (B), and Nubian ibex (C) from the tomb of Mera at Sakkara. (After Gaillard.)

ciation with those of domesticated cattle and goats. That they were kept in a captive condition is indicated by the circumstance that in each case they are shown feeding out of a trough and haltered, and also by the prefix or the word *ran*, apparently indicating domestication, to their names.

THE January number of *The Quarterly Journal of Microscopical Science* (vol. lviii., part 3) again bears witness to the large amount of experimental investigation which is being carried on by biologists. The eggs and larvæ of sea-urchins afford material for no fewer than three papers by different writers. There is an interesting paper by the late G. H. Grosvenor, whose untimely death has inflicted a great loss upon zoological science, and Geoffrey Smith, on the life-cycle of the small fresh-water Crustacean, *Moina rectirostris*. These authors point out that, according to Weismann, sexual forms should be produced in every parthenogenetic generation independently of external conditions, but they actually find that by isolating the parthenogenetic females at birth until the production of the brood at a temperature of 25° to 30° C., the production of sexual forms is entirely suppressed. They conclude that the influence of isolation and of a high temperature on the suppression of the sexual forms may be ascribed either to the comparative absence of excretory matter or else to highly favourable nutritive conditions. Another memoir of special interest to students of animal bionomics is on stolon formation in the remarkable polychæte worm, Trypanosyllis, by F. A. Potts, which forms an important contribution to our knowledge of the very curious processes of asexual multiplication by budding that take place in this group. We must, however, enter a protest against the use of the term "stolon" for the reproductive individuals which arise by budding in such cases.

ALTHOUGH much work has been done in recent years on the bacteriological conditions in soils in temperate zones, there has been hitherto a scarcity of data relating to soils in tropical and subtropical countries. On this account a report of studies on Indian soils, by Mr. C. M. Hutchinson (Memoirs of the Department of Agriculture in India, Bacteriological Series, vol. i., No. 1), forms a welcome addition to the subject. Investigations have been undertaken with the view of testing the methods already in general use for the purpose of ascertaining their value under Indian conditions. The phenomena associated with the partial sterilisation of the soil, the occurrence of bacteriotoxins, and the rapidity of biochemical changes, such as ammonification, nitrification, and nitrogen fixation, have been subjected to a critical study. The view that the decomposition of cellulose is due chiefly to the activities of anaërobic organisms is perhaps given too much prominence in the discussion of the utilisation of organic residues.

MR. J. VAN BAREN, of the Landwirtschaftliche Hochschule in Wageningen, Holland, publishes in the *Compte rendu* of the eleventh International Geological Congress a paper on red stony loam as a product of interglacial weathering. He notes the occurrence of this material as isolated sheets in eastern Holland, overlain by Boulder Clay or Boulder Sand, and points out that the fragments of iron-bearing silicates in the red loam show, by their rusted condition, signs of atmospheric weathering. The small pebbles are also strikingly attacked, in distinction from those obtained from the sandy residue of the overlying Boulder Clay. The author urges that the Red Boulder Loam is decidedly older than the second series of glacial deposits above it, and that its weathered condition indicates exposure during an interglacial epoch. The analyses given do not support his contention that the products of weathering are lateritic. Comparisons are made with similar materials in north Germany, north Italy, the east coast of England, and the United States, and the desirability of chemical investigations of these is pointed out. In the discussion on the paper Mr. van Jentsch urged that a red colour in such deposits does not always imply a weathered condition.

WE have received a separate copy of the address given by Prof. J. von Kowalski to the Swiss Naturforschenden Gesellschaft at the Altdorf meeting last year. It deals with the relations between radiation and energy, and, after giving an account of the work of Wien and others, sketches the quanten theory as advanced by Planck, and stated with great clearness by Einstein in 1905. After showing how fertile the theory has been in suggesting new lines of research in both theory and experiment, the author emphasises the fact that at the present time the point of view provided by the theory is already known to be too restricted. Having served the true function of a theory—to indicate the line of advance—it must soon be replaced by some more general conception which will make clear to us those relations between matter and energy of which the quanten theory has given us a misty glimpse.

OBSERVATIONS on the seiches of Japanese lakes were begun in 1901, on the suggestion of Prof. Nagaoka. Four years later, the seiches of the nearly circular lake Toya, in the island of Hokkaido, were found by Prof. Honda to have a period of 9·29 minutes. In 1911, Mr. N. Mori found the period to be 4·5 minutes, and suggested that the mean depth of the lake had increased by about fifty metres during the interval of seven years. Mr. K. Sano shows, however, that the two periods may be the result of different modes of vibration if account be taken of the existence of the circular island in the middle of the lake (Journ. Meteor. Soc. of Japan, January). He finds that the period of the seiches would be 10·25 minutes if the water oscillate with a straight nodal line through the common centre of the lake and island; and 3·9 minutes if there were a circular nodal line midway between the boundaries of the island and lake.

A PAPER on measurement of the flow of the River Derwent, Derbyshire, by Mr. E. Sandeman, read before the Institution of Civil Engineers on April 1, contains some interesting particulars. The flow of the river has been measured since 1905, when a weir was built by the Derwent Valley Water Board, to ascertain the yield from an area of about fifty square miles of the northern portion of the watershed. The area in question varies in elevation from 500 to 2060 ft. Rain-gauges to the number of forty-six were fixed on this area, being approximately 1 to each 700 acres. In the last thirteen years the recorded rainfall has averaged 46·34 in. The lowest rainfall of any of the gauges was 34 in., and the highest 61 in. The flows over the measuring weir are recorded on a rotating drum driven by clockwork with cam attachment. The highest flood on the drainage area occurred before the building of the weir. It was calculated to have reached a flow of 486 cu. ft. per sec. per 1000 acres from an area of 9321 acres. The minimum flow recorded was 0·29 cu. ft. per sec. per 1000 acres. Records of evaporation from a water surface 6 ft. square showed a variation from 10·25 in. in 1907 to 19·62 in. in the year 1911. The general result of the measurement of the rainfall and the yield of the river showed that the quantity of water collectable was—on the average of the seven years under consideration—equal to 75·2 per cent. of the rainfall.

Messrs. Longmans, Green and Co. have in preparation a series of monographs on physics, which will to some extent follow the lines of their monographs on biochemistry and on inorganic and physical chemistry. The editors of the physical series will be Sir J. J. Thomson, O.M., F.R.S., and Dr. F. Horton, of the Cavendish Laboratory, Cambridge. The first volume in the series will be "Rays of Positive Electricity," by Sir J. J. Thomson.

Messrs. Henry Sotheran and Co., 140 Strand, and 43 Piccadilly, London, have issued part viii., forming part iii. of the Supplement, of their "Bibliotheca Chemico-Mathematica." The catalogue not only contains an unusually complete collection of works on the exact sciences, including many old works of rarity and interest, but also on such kindred subjects as ballooning, horology, and meteorology. The net prices of the volumes are given in every case.

The classified list of Smithsonian publications, available for distribution on January 1 last, has been published by the Smithsonian Institution of Washington. The institution is able to supply papers only as an aid to the researches or studies in which applicants are especially interested. The papers included in this list are distributed gratis, except as otherwise indicated. Of the serial publications of the institution, the volumes of "Contributions to Knowledge" and of "Miscellaneous Collections" are distributed only to public libraries and to learned societies.

Messrs. J. and A. Churchill announce the following works for early publication:—"Liquid Air, Oxygen, and Nitrogen," by G. Claude, translated from the French by H. E. P. Cottrell; "The Examination of Waters and Water Supplies" (second edition), by Dr. J. C. Thresh; "A Laboratory Text-book of Chemistry," part i., by V. S. Bryant; vol. vii. of the new edition of "Allen's Commercial Organic Analysis," rewritten, under the editorship of W. A. Davis and S. S. Sadtler.

OUR ASTRONOMICAL COLUMN.

Astronomical Occurrences for April:—

April 6. 5h. 33m. Sun eclipsed, invisible at Greenwich.
,, 12h. 0m. Jupiter at quadrature to the Sun.
8. 5h. 10m. Venus in conjunction with the Moon (Venus 4° 1′ N.).
9. 22h. 41m. Saturn in conjunction with the Moon (Saturn 6° 22′ S.).
20–22. Maximum of Lyrid meteors.
24. 14h. 0m. Venus in inferior conjunction with the Sun.
,, 17h. 0m. Mercury at greatest elongation W. of the Sun.
26. 2h. 13m. Jupiter in conjunction with the Moon (Jupiter 5° 9′ N.).
27. 16h. 24m. Uranus in conjunction with the Moon (Uranus 3° 52′ N.).
,, 21h. 0m. Uranus at quadrature to the Sun.

The Radial Velocity of α Persei.—Hnatek having recently published the conclusion that the radial velocity of α Persei varies in a period of 4·1 days, it appeared desirable to Mr. J. H. Pitman (Lick Observatory Bulletin 224) to undertake a comprehensive treatment of the subject based on all available observations. In addition to the many results already published by various authorities, the chief being the long series by Goos and Hnatek, the author has employed ten hitherto unpublished determinations. Six of these made during October, 1912, give a mean velocity of −2·49±0·42 km. per second. The discussion leads to the conclusion that the radial velocity of α Persei must be either constant or only minutely variable in a period still undetermined.

The Smithsonian Astrophysical Observatory.—The report on the operations of the Smithsonian Astrophysical Observatory for the year ending June 30, 1912, has been received. The director, Mr. C. G. Abbot, is to be congratulated on the success at last attending his persistent efforts to obtain a grant from Congress. This enabled simultaneous spectrobolometric determinations of the solar constant of radiation to be made at Bassour, Algeria, by the director, and at Mount Wilson by Assistant Aldrich, on twenty-nine days during August–November, 1911. The observations have not yet been completely reduced, but so far as the first half of September the values obtained at Bassour agree with those previously determined at Washington and Mount Whitney in indicating a local condition at Mount Wilson tending to make the results too small by about 2 per cent.

Further, it appears that high solar constant values obtained at Bassour coincide with high values at Mount Wilson, and *vice versâ*. This relation is exhibited in two diagrams; in the first the curves obtained by plotting the successive values at the two stations show a rough parallelism; in the second the simultaneous values are plotted, and instead of grouping round a centre they are seen to be strung out along a line. It is further stated that a solar variation of 4 per cent. was indicated at both stations. The importance of setting at rest the question of the variability of this fundamental factor in meteorology is thoroughly realised by the energetic director, who returned to Bassour last May to extend his former observations. Mr. Fowle had already commenced work at Mount Wilson in April. It is confidently anticipated that the combined results will be decisive. The solar constant work has received help from valuable results obtained by Mr. Fowle in continuation